Claims 6 and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shimamoto and Scheller in further view of Machino.

Claims 17-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nichols and Lyman, in further view of German patent 945,183.

Claims 20 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nichols and Lyman, in further view of Schoeb.

These rejections are respectfully traversed and reconsideration is respectfully requested.

Allowable Subject Matter

It was indicated by the Examiner that claims 11-13, 15 and 16 would be allowable if rewritten in independent form. Accordingly, Applicant has rewritten claims 11, 15 and 16 in independent form, and, therefore these claims are now allowable. Claim 12 depends from claim 11, and claim 22 depends from claim 16, and thus, these claims are also allowable for at least the same reasons as claims 11 and 16.

The Section 103 Rejection Over Nichols In View Of Lyman

With regard to claim 1, the Examiner contends that Nichols would disclose the claimed invention except for the permanent magnets distributedly arranged on the rotor and since permanent magnets on the rotor are known from Lyman, it would have been obvious to construct the Nichols system with permanent magnets on the rotor.

Applicant respectfully disagrees for the following reasons.

No Motivation To Combine

The Examiner does not show a motivation to combine Nichols and Lyman necessary to create the case of obviousness. The court held in *In re Rouffet* 149 F.3d 1350, 1357 (1998) that the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed, pointing out that the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness. The examiner did not identify any motivation to choose Nichols and Lyman for combination, except for showing that the elements of both Nichols and Lyman are present in the claimed

invention. See page 7, lines 10-11 of the office action: "Nichols teaches the unipolar rotor journalled to the stator. Lyman merely teaches including a permanent magnet on the rotor." The court in *In re Rouffet* makes it clear that finding every element of claimed invention in the prior art is not a sufficient ground to claim obviousness, and that most if not all inventions are combinations of old elements, and if identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. *Id*, 1357. The court further states that rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. *Sensonics, Inc. v. Aerosonics Corp.*, 81 F.3d 1566,1570 (Fed. Cir. 1996).

Nichols does not teach generating an inhomogeneous bias flux by permanent magnets on the rotor. Nichols teaches generating the biased magnetic flux in the stator, not in the rotor. Furthermore, Nichols accomplishes the inhomogenuety of the biased magnetic flux by means of the geometric design of the rotor, not by permanent magnets. Nichols does not teach using permanent magnets on the rotor for accomplishing inhomogenuety of the biased magnetic flux, neither does Lyman. Lyman does not teach generating an inhomogeneous unipolar bias magnetic flux on the rotor. While Lyman teaches using permanent magnets on the rotor, the objective of Lyman is to make the biased magnetic flux as homogeneous as possible for the disclosed magnetic suspension system, and any possible disturbance of homogenuety of the flux is characterized by Lyman as an undesirable secondary effect adverse to the objectives of the invention. Lyman suggests that it should be minimized and further suggests how the net unbalanced contribution of permanent magnets, and the flux induced thereby shall be compensated. See col. 1, lines 41-42, col. 3, lines 37-42, col. 5, lines 63-66, col. 6, col. 32-40 of Lyman.

The Examiner states "The fact that Lyman teaches a homogeneous flux does not prevent Lyman from suggesting that the magnet would be included on the rotor for other purposes..." The court in *Gore* held that a prior art reference must be considered in its entirety, as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983). The Examiner's statement quoted above indicates that Lyman's invention was not considered in its entirety, including the portions that would lead away from claimed invention, namely Lyman's indication that inhomogenuety of the biased magnetic flux in the rotor should be minimized.

It is, therefore, clear in view of these references, each in its entirety, that a person of ordinary skill confronted with the problem of accomplishing inhomogeneous magnetic flux in the rotor would be deterred from any investigation into the combination of references since one reference teaches minimizing inhomogenuety of magnetic flux in the rotor (Lyman), while the other does not teach generating any inhomogenuety of magnetic flux in the rotor at all (Nichols).

Combination fails

Even if the references were combined as suggested by examiner, the combination fails to make obvious the pending claims.

The Examiner cites Nichols for teaching a unipolar rotor journalled to the stator, and Lyman for using permanent magnets on the rotor to generate an inhomogeneous magnetic flux in the rotor. Thus according to the Examiner, Lyman would make up for the deficiencies in Nichols. Applicant respectfully disagrees with the Examiner's analysis. Nichols teaches that the bias magnetic flux is generated in the stator, while Lyman teaches a preferably homogenous magnetic field in the rotor. In contrast, the claimed invention discloses generating inhomogeneous unipolar bias magnetic flux on the rotor by means of permanent magnets on the rotor such that the bias magnetic flux is inhomogeneous at the axially upper and lower part of the rotor and homogeneous in the middle section where the ring 10 is located. Thus, the bearing forces controlled by stator 21 can act upon the homogeneous part of the rotor, whereas the driving forces generated by stator 22 and stator 23 can act upon the inhomogeneous part of the rotor, and, therefore both requirements of a homogeneous flux for the bearing function and inhomogeneous flux for the driving function are concurrently fulfilled. Neither of the cited references teaches or even mentions generating inhomogeneous magnetic flux on the rotor by means of the permanent magnets. Therefore, even if the teachings of Nichols and Lyman were combined, they do not even suggest what to do with the resulting system. Only the present patent application discusses generating inhomogeneous unipolar bias magnetic flux on the rotor by means of permanent magnets on the rotor such that the bias magnetic flux is inhomogeneous at the axially upper and lower part of the rotor and homogeneous in the middle section. It is thus apparent that the Examiner used an impermissible hindsight by using the Applicant's own disclosure to provide motivation to combine Nichols's reluctance motor with the missing disclosure of using permanent magnets on the rotor from the above combination.

Accordingly, it respectfully submitted that one skilled in the art would not be motivated to combine the teachings of Nichols and Lyman in order to arrive at the present invention, and even if these references where combined, their combination would not result in a system as recited in claim 1. Accordingly, it is respectfully submitted that claim 1 is allowable.

Claims 3-10, 14 and 17-21 depend, either directly or indirectly, on claim 1 and therefore they are allowable for at least the reasons claim 1 is allowable. These claims further define and augment features of applicant's invention.

The Section 103 Rejection Over Shimamoto In View of Scheller

It is respectfully submitted that Shimamoto does not propose to generate an inhomogeneous unipolar bias magnetic flux. Shimamoto provides separate drive means, both in the rotor and in the stator for driving the rotor. The Examiner states that in Sheller the magnetic flux is inherently spatially modulated between the magnets, because Sheller teaches a ring magnet constructed from a plurality of magnets that are "closely spaced, or if necessary may be somewhat separated" col. 3, lines 29-30. We disagree with the Examiner's statement that Sheller teaches an inhomogeneous magnetic flux. Even if the magnetic field is to some extent spatially modulated between the magnets, due to the structure of the system, this effect, as in Lyman, is adverse to the objective of the invention, and is not taught as a feature of the invention. As was shown before, Sheller discloses a flywheel that requires a homogeneous magnetic flux to function as disclosed. Therefore it is respectfully submitted that one skilled in the art would not be motivated to combine the teachings of Shimamoto and Scheller for accomplishing an inhomogeneous magnetic flux on the rotor by means of permanent magnets on the rotor. But even if the teachings of Shimamoto and Scheller were combined, there is no disclosure at all in either reference to generate an inhomogeneous unipolar bias magnetic flux.

Accordingly, since neither Shimamoto nor Scheller, neither alone nor in combination, teach, disclose or suggest a magnetically journalled rotational arrangement as recited in claim 1, claim 1 is allowable.

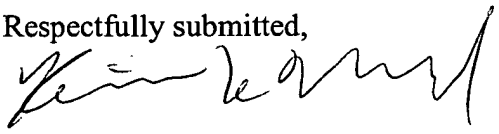
Claims 3-10, 14 and 17-21 depend, either directly or indirectly, on claim 1 and therefore, they are allowable for at least the reasons that claim 1 is allowable.

CONCLUSION

Attached hereto is a marked-up version of the changes made to the claims by the current amendment along with a complete set of pending claims provided for the Examiner's convenience. The attached pages are captioned "Version With Markings To Show Changes Made" and "Claims Appendix."

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is urged. If the Examiner believes a telephone conference would aid in the prosecution of this case in any way, please call the undersigned at 415-576-0200.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO THE CLAIMS

Please amend claims 11, 15 and 16.

11. (Twice Amended) A magnetically journalled rotational arrangement **[in accordance with claim 8]** comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator effecting the magnetic journalling of the rotor is designed substantially in ring shape and surrounds the ring or disc-shaped rotor,

[with] wherein the stator plane and the rotor plane **[coinciding and forming the]** coincide and from a bearing plane, and

wherein the means for **[production of]** generating the field **[which produce the rotation of the rotor]** are arranged in the segments between the permanent magnets in the stator so that the motor plane in which the rotation of the rotor is produced and the bearing plane in which the journalling of the rotor is produced coincide.

15. (Twice Amended) A magnetically journalled rotational arrangement **[in accordance with claim 14]** comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

[wherein the] a plurality of permanent magnets **[are]** arranged on both sides of the rotor to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, and **[wherein]**

the stator **[, in addition to the ring shaped stator, which produces the magnetic jurnalling of the rotor]** further comprises two **[further]** ring-shaped motor stators, **[of which one]** wherein the first motor stator is arranged in a first motor plane parallel to the bearing plane on the one side of the bearing stator and the **[other]** second motor stator in a second motor plane parallel to the bearing plane.

16. (Twice Amended) A magnetically journalled rotational arrangement **[in accordance with claim 14]** comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, and

[wherein the stator, in addition to the ring shaped stator, which produces the magnetic jurnalling of the rotor comprises a further disc-shaped stator in a motor plane parallel to the bearing plane, with this motor stator being designed as a disc stator and] the stator further comprises a disc-shaped motor having a disc rotor winding **[for the production of the field for the rotation of the rotor]** and arranged in a motor plane parallel to the bearing plane.

CLAIMS APPENDIX

1. (Amended) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and a stator which comprises means for the production of a field which produces a rotation of the rotor, wherein the rotor has means which generate a unipolar bias magnetic flux which is spatially modulated when viewed in the circumferential direction.

2. (Amended) A rotational arrangement in accordance with claim 1 wherein the means for producing the spatially modulated bias magnetic flux comprise permanent magnets which are distributedly arranged on the substantially disc-shaped or ring-shaped rotor.

3. (Amended) A rotational arrangement in accordance with claim 2 wherein the permanent magnets are arranged at both sides of the disc-shaped or ring-shaped rotor.

4. (Twice Amended) A rotational arrangement in accordance with claim 2 wherein the permanent magnets have an axial or a radial magnetization.

5. (Twice Amended) A rotational arrangement in accordance with claim 2 wherein permanent magnets are provided both on the rotor and on the stator; and wherein both the permanent magnets provided on the rotor and the permanent magnets arranged on the stator are magnetized in the axial direction.

6. (Twice Amended) A rotational arrangement in accordance with claim 2 wherein permanent magnets are provided both on the rotor and on the stator; and wherein both the permanent magnets provided on the rotor and the permanent magnets arranged on the stator are magnetized in the radial direction.

7. (Twice Amended) A rotational arrangement in accordance with claim 2 wherein permanent magnets are provided both on the rotor and on the stator; and wherein the permanent magnets

provided on the rotor are magnetized in the axial direction while the permanent magnets arranged on the stator are magnetized in the radial direction or vise versa.

8. (Twice Amended) A rotational arrangement in accordance with claim 1 wherein, in addition to the means for the production of the field which produces the rotation of the rotor, the stator comprises permanent magnets which are arranged in such a manner that they cooperate with the means provided on the rotor for the production of the spatially modulated bias magnetic flux in such a manner that they produce or reinforce the magnetic journalling of the rotor.

9. CANCELED

10. (Twice Amended) A rotational arrangement in accordance with claim 1 wherein control windings are provided in the stator in order to control the spatially modulated unipolar bias magnetic flux.

11. (Twice Amended) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator effecting the magnetic journalling of the rotor is designed substantially in ring shape and surrounds the ring or disc-shaped rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the means for generating the field are arranged in the segments between the permanent magnets in the stator so that the motor plane in which the rotation of the rotor is produced and the bearing plane in which the journalling of the rotor is produced coincide.

12. (Amended) A rotational arrangement in accordance with claim 11 wherein the means for the production of the field which effects the rotation of the rotor and which is arranged in the segments between the permanent magnets has U-shaped coil cores with windings, with the U-shaped coil cores being arranged in the bearing plane.

13. (Amended) A rotational arrangement in accordance with claim 11 wherein the means for the production of the field which effects the rotation of the rotor and which is arranged in the segments between the permanent magnets has U-shaped coil cores with windings, with the U-shaped coil cores being arranged perpendicular to the bearing plane.

14. (Amended) A rotational arrangement in accordance with claim 8 wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, with the stator plane and the rotor plane coinciding and forming the bearing plane; and wherein moreover the stator comprises at least one further ring or disc-shaped motor stator which is arranged in a motor plane parallel to the bearing plane.

15. (Twice Amended) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged on both sides of the rotor to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, and

the stator further comprises two ring-shaped motor stators, wherein the first motor stator is arranged in a first motor plane parallel to the bearing plane on the one side of the bearing stator and the second motor stator in a second motor plane parallel to the bearing plane.

16. (Twice Amended) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, and

the stator further comprises a disc-shaped motor having a disc rotor winding and arranged in a motor plane parallel to the bearing plane.

17. (Amended) A rotational arrangement in accordance with claim 8 wherein the means for the production of the field which effects the rotation of the rotor comprises a rotatable drive which can be magnetically coupled to the rotor and the axis of rotation of which coincides with the axis of rotation of the rotor.

18. (Amended) A rotational arrangement in accordance with claim 17 wherein the drive comprises permanent magnets which are magnetized in the axial direction.

19. (Amended) A rotational arrangement in accordance with claim 17 wherein the drive comprises permanent magnets which are magnetized in the radial direction.

20. (Twice Amended) A forwarding apparatus, in particular for highly pure or biological liquids, especially a blood pump, with a rotational arrangement in accordance with claim 1.

21. (Twice Amended) A stirrer for a bio-reactor comprising a rotational arrangement in accordance with claim 1.

22. A rotational arrangement in accordance with claim 16 wherein the disc rotor winding is iron-less.